Reviewer's report

Title: Clinical Decision Support Improves Physician Guideline Adherence for Laboratory Monitoring of Chronic Kidney Disease: A Matched Cohort Study

Version: 1 Date: 3 January 2015

Reviewer: Khaled Abdel-Kader

Reviewer's report:

This is a clustered prospective cohort study with patient matching examining a paper-based CDSS paired with lab results from Labcorp. This is a novel study, but there are several important limitations that require consideration and acknowledgement.

Major revisions:

1) Please include more information on the providers. What proportion were approached, agreed to receive the CDSS, refused, etc. Please provide comparisons re: provider characteristics (age/years since training, size of practice/pts seen per day, labcorp market share in the given practice locale). If these are not available, please acknowledge as a limitation).

2) While the potential for chance associations is acknowledged, please more fully acknowledge additional key pt level confounders not assessed/adjusted for in the current study (comorbidities, SES, insurance status, etc).

3) Missing data is a significant limitation that should be acknowledged. This manifests in several ways. First, there is a disconnect between table 2 and 3. While there were 43K and 12K in usual care and CDSS arms, most of the analyses for frequency of monitoring only include 20K and 8K patients in the respective arms. It's not clear how similar those specific subgroups are based on table 2's baseline characteristics.

4) In addition, for table 4 and figure 4, missing data and ascertainment bias is likely to affect results. There are repeated measures of a subgroup of patients (while other patients have no values) when assessing achievement of the target range. Patients with elevated values are likely to have more frequent rechecks than those with goal values, thereby skewing the results. Patients without values are unknowns, but the missingness likely reflects their underlying clinical symptoms/state. Discussion of the achievement of goal values should be very cautious acknowledging these concerns.

5) Please remove or provide further justification for the statement "The differential we found supports the validity of our study, as it would be difficult to imagine how an artifact of selection would create it." In a hypothetical exercise study, patients who choose to enroll (vs. controls who are not interested) are more likely to exercise (due in part to selection bias). The exercise intervention effect is blunted
in the subgroup of patients who are professional athletes at baseline. I'm not clear why this differential effect in people with different characteristics alleviates concerns re: selection bias.

6) The 3 mo 'add on' period (after the last accession date) represents a disproportionate period of time given the relatively short 8.4mo median f/u. Please consider a sensitivity analysis excluding this extra 3mo period (when providers may have used other labs or patients may have been lost to f/u for other reasons).

Minor essential revisions:
1) The potential use of outside commercial labs by a provider is not discussed.

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests'